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CENTRAL INTELLIGENCE AGENC

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Comments

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- 1. Throughout the attached report read Sukhumi instead of Sukhum, Cchemchini instead of Oczemchini or Oczemchini, Kochlavashvili instead of Kochvachvili.
- 2. The German scientists incompletely identified in the attached report are probably the following: Dr. Heinz Froehlich, Dr. Karl Bernhard, Kipl. Ing. Gerd Mueller, Dr. Hans Emil Lehmann, Dr. Herbert Reibedanz, Dr. Heinz Karl Moehr, Dr. Eberhard Steudel, Dr. Wilhelm Menke, Frau Elsa Suchland.

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	institute was a	liegedly called In	stitute.	A. Manfred vo:	n Ardenne was	•
	acted as Soviet	German leader. Ger chief. The institu	ute was	subordinated	to the them IXth	
	MVD Main Admini	stration (now: 1st	Adminis	tration) in Ma	oscow.	
2.	The following G	erzen specialists	were rep	orteds		
	Chief of the in				on Ardenne	
	Department of A	pplied Physics:			lich (fnu) rt Verlings	
				Dr. Bernh	ard (fnu)	
				Dr. Huelle Dr. Lehma	nn (fnu)	
				Engineer : Neureuter		
	· Chemical Deps.	rmant.			Dr. Peter-Adolf	Threen
	oremiters report	STREET DE		Dr. Moehr	and the second s	

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In Moscow, the German specialists were lodged in the "Mosse at the Lake" on Mohaiski road located some 35 km southwest of Moscow.

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Ill scientific meetings and conferences took place in the Chaihovsky Reception Room at Sadova street.

Objectives at the Since Institute

Prior to 1950, work was concentrated on the following issues:

7. Construction of an ultracentrifuge.

This task was performed by Dr. Steenbeck. His ultracontribuge operated successfully and he was awarded a high bonus. The following daya regarding his ultracentribuge were reported:

diameter 590 mm 1 scheduled rotational speed 100,000 r.p.m. rotational speed reached 90,000 r.p.m. separation factor attained 40-fold.

S. Experimental work with the ultracentrifuge.

The ultracentrifuge was said to have operated satisfactorily, but no further details were offered. Source believed that the ultra-centrifuge offers unlimited possibilities and outranks all other isotope separation methods. The PWs Zawadill and Kafka assisted at the construction of the ultracentrifuge and in the experiments conducted with it.

9. Construction of a van-de-Graff generator.

Although this bask was assigned to him, Dr. Bernhard did not carry out this project. 2
Experiments were conducted by Ardenne and Bornhard with an old van-de-Graaf generator available at the institute and which served as a pattern for a new generator. No tangible results were obtained and Ardenne and Bornhard suffered severe burns as a result of careless handling of the apparatus.

10. Cagnetic isotopic separation.

Lagratic isotopic separation was performed by Prochlich out this method was considered unsatisfactory. The available magnets including the large magnet from the former Reichspost Forschungsinstitute proved inadequate.

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- Il. Separation by diaphragnatic diffusion was performed by Frof. Thyssen.
- 12. A symbolism was under construction but was not get completed by the end of the period under observation. It was believed to be ready for overation in 1952.

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Lagnetic isotopic separation.

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Innumerable experiments led to satisfactory results, yet

there seems little to be gained in this way if compared with the achievements reached by the ultracentrifuge. Nevertheless

adequate results might be reached by using giant

magnets.

14. The following details were recorted:

All work on magnetic isotopic separation was based on the Elin Magnet from the former Berlin-Niersdorf Reichspost-Forschungsinstitute. The circular poleshoes of this magnet were transformed to square shaps in order to accomposate the separation chamber. This high-vacuum chamber which was to go into the magnet had brass walls 1,200 mm long, 800 mm wide and 30 mm thick. The lid and bottom of the chamber were bound thick iron plates screwed onto the chamber. The chamber enclosed another smaller chamber called the "Monante". Although there was practically only active D, the name Monante was chosen in comparison with D, and D, of the cyclotron, the ion source being regarded as D, the cover of the chamber being the imaginary D, During the experiments, the monante was kept at varying distances from the outer chamber. Finally a 140 mm distance was found effective and was secured by porcelain insulating supports.

15. The ion located below the monante consisted of a tungsten furnace 90 nm high and 20 nm in diameter encased in a 50 mm thick water-cooled copper jacket. After painstaking investigations, a 10 mm distance between the furnace and the copyer jacket was found the appropriate distance to provide for the thermal expansion. The copper jacket was covered by as outer molybdenium sheet with an intermediate tungsten layer. The secondary ribbon-shaped cathode was located centrally above the furnace. The ionization cathode was located at the upper rim of the furnace with the ionization slit, the ionization space, and an arrangement of two molybdenium screens leading into the monante, the so-called Pierce optical system. The thorium oxide crucible holding 3 to 4 grams of pure uranium to be vaporized was located below the furnace. The support of this crucible was a major problem since the thorium exide did not resist the furnace temperature of up to 2,300 degrees centragrade for more than a few hours and had then to be replaced. The crucible was enclosed in a rediation protection shell of an cuter layer of molybdenium and an inner layer of tantalium. The most meticulous construction of the unit was imperative. The slightest tilting of the cathode could cause melting. of the curcible, and the uranium flowing into the radiation protection shell would present serious hazards. The use of graphite crucibles was discontinued after some experimenting for being inadequate.

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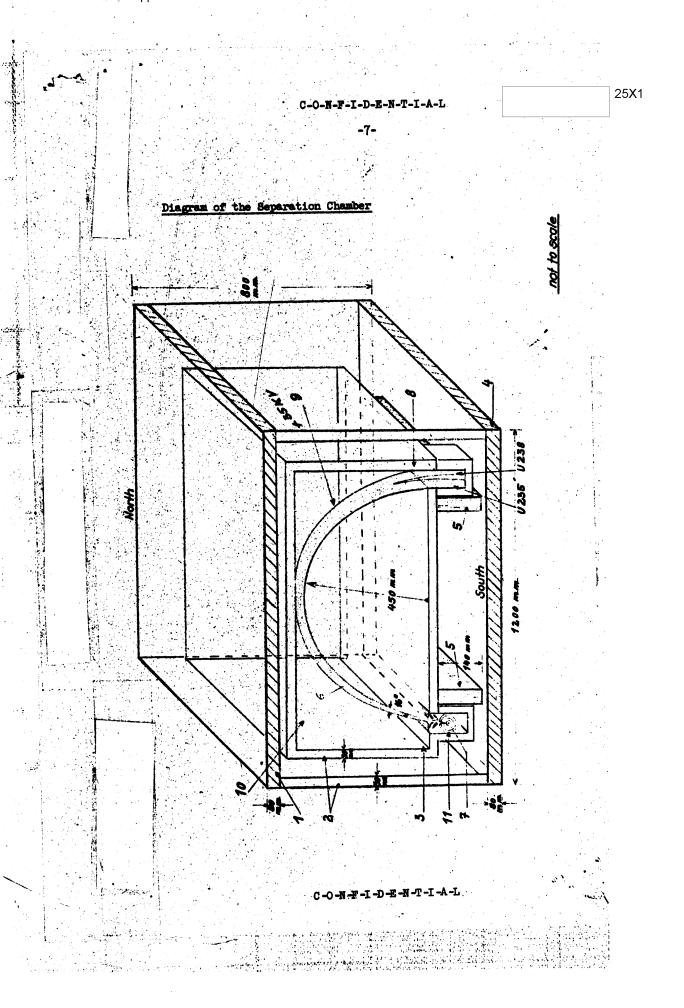
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Operation of the Carmetic Separation Unit

- 16. The cathode rays of 300 V/0.5 amp, intensity from the cathode above the furnace heated the uranium contained in the crucible, provided a constant temperature of the uranium, and stabilized the vapor pressure within the furnace. The ionization cathode which was kept at 1 lower temperature of 900 degrees centrigrade prevented undesirable plasma oscillations.
- 17. The unit operated on a modified Pierce principle with three electrodes. The ion beam leaving the ion source at a 16 degree angle through the 4 mm wide ionization slit had a maximum radius of curvature of 450 mm and was collected by 35 kV. Attempts were made to diminish the dispersion of the ion beam through the 4 mm wide ionization slit to 2 mm width with the aid of ionization compensation through the Pierce system. The construction of the collector was the most difficult problem and continued to be unsatisfactory. Attempts to construct a brake-field collector ended in failure. By the end of the period under observation, the unit operated satisfactorily and the modified Pierce optical system provided trouble-free operation.

	The Proton Source	•
18.		25 X 1
	Further details will be forthcoming.4	25X1
	Difficulties in the Materials Supply	
19.	Prior to 1948, tungsten sheets were imported When these imports were stopped, work on uranium evaporation had to be suspended	25 X 1
	for 6 months. The situation was then relieved by illegal imports No difficulties in the materials supply were noted in other rigids.	25X1 25A1
1.	Comment. The alleged 590 mm diameter of the ultracentrifuge is supposed to be a typographical error.	25 X 1
2.	Comment. Craduate engineer Bernhard (fnu) was to re-assemble a small van-de-Graaf generator dismantled in Berlin. This project was, however, suspended.	25 X 1
3.	Comment. For sketch of the separation chamber, see Annex 1.	25 X 1
4 .	Comment. For schematic diagram of the proton source, see Annex 2.	25 X 1



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Diagram of the Separation Chamber

Legend.

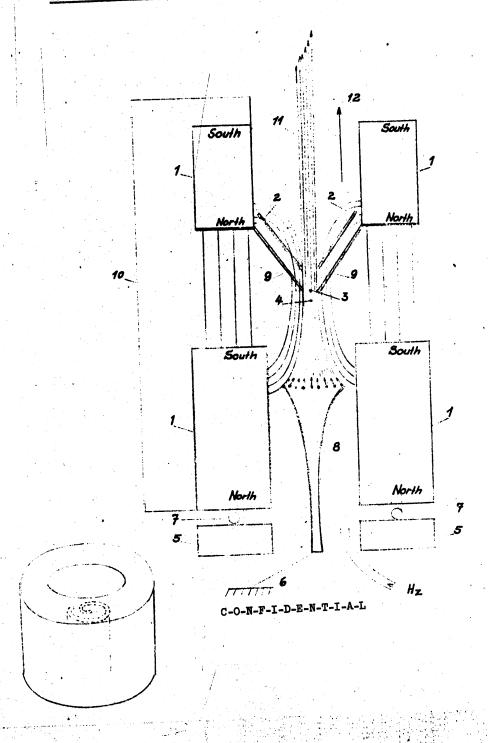
- 1 Screwed-on iron place 50 am thick
- 2 Brass walls of separation chamber and monaste, approximately 30 mm thick
- 3 lon-source side of the separation chamber
- 4 Barewed-on iron bottom plate, 50 um thick
- 5 Poscelain insulating supports 140 mm high
- 6 Ion beam
- 7 Tungsten case for furnace
- 8 Collector side of the separation chamber
 - 9 Separation of ion beam
- 10 "Lonante" (inner chamber)
- ll Iou source

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Schematic Diagram of Proton Source



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Schematic Diagram of Proton Source

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- ? ~ Circular magnets
- 2 4,000-V collector electrode
- 3 Plasma space
- 4 Magnetically converged electron beam
- 5 Tantalium sheet horns
- 6 Ground potential
- 7 Rubber insulation
- 8 Equipotential cathode
- 9 ~ Cathole heating (80 V)
- lo Iron clip
- 1) Deuterium for beam
- 12 Coltector pump

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